

# ATOMIC ENERGY *newsletter*®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH  
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

November 16th, 1954  
Vol. 12...No. 7

Dear Sir:

The oldest continuing company active in atomic energy, Vitro Corporation of America, has now entered the field of uranium mining, according to W. B. Hall, general manager of Vitro Uranium Company, the division of the corporation which operates a uranium ore processing mill. Vitro has acquired an interest in 57 uranium claims from the Sateco Mining Co. in the Gas Hills area of Fremont County, Wyo., and has started exploration and drilling. (In its other divisions, Vitro Corp. does design and engineering of processing plants and technical facilities, particularly in the fields of atomic energy and newer elements and metals; chemical and physical research; refining of rare metals; etc. Vitro entered atomic energy in 1942.) (Other RAW MATERIALS news, page 2 this LETTER.)

Direct line responsibility for the large ship nuclear reactor project at Westinghouse has now been given to J. C. Rengel who has been appointed manager of this project, according to C. H. Weaver who is manager of Westinghouse's atomic power division. Westinghouse is prime contractor under the USAEC and Department of Defense for the LSR (large ship reactor) project..... New president and a director of Climax Uranium Company is Frank Coolbaugh, who replaces J. H. White, Jr., resigned. Mr. Coolbaugh is vice-president, Western operations, Climax Molybdenum Co., parent concern of the uranium company. In his new post he will be in charge of all mining, milling, and exploration operations of both Climax Molybdenum and its associated companies.

Beckman Instruments, Inc., Calif., has now achieved sales and earnings in the year ended June 30, 1954, the highest in its history, according to A.O. Beckman, president. Beckman, manufacturer of precision instruments, is a long time producer of radioactivity measuring devices. Net sales for the fiscal year were over \$18 million, compared with over \$16 for the year previous. Meanwhile, in New York, a syndicate headed by Lehman Brothers placed on the market 150,000 shares of new Beckman common stock, at \$22 a share. Of about \$3 million of net proceeds accruing to the company from the sale, \$1 million will be used to pay off all outstanding short term unsecured notes; the rest into Beckman's general funds.

Bradley Container Corp., Maynard, Mass., is now installing a 2,000,000 electron-volt particle accelerator for radiation sterilization of already-packaged drugs, pharmaceuticals, and other products. It is believed that this is the first such commercial application of radiation sterilization. (Other RADIATION applications, p. 5 this LETTER.)..... Sterilization of air, foods, and pharmaceuticals through X-rays, cobalt-60, etc., is the subject of a 32-page bibliography of periodical literature, research reports, and patents published since 1950. The bibliography (prepared by the Quartermaster Research & Development Laboratories) may be obtained at \$1 from Office of Technical Services, Wash. 25, D.C. (Other BOOK & PUBLICATION NEWS, p. 5 this LETTER.)

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BUSINESS NEWS...in the nuclear energy field...

NEW PRODUCTS FOR NUCLEAR WORK INTRODUCED:- A new pump, designed to move liquid metals, which has applications in heat transfer systems using nuclear reactors, is now being marketed by Callery Chemical Co., (Callery, Pa.) The pump, which operates on an electromagnetic principle, with no moving parts and no packing glands, has its flow rate adjustable from zero to maximum flow by an adjustable autotransformer. The manufacturer states that the pumps are normally tested at 1000-deg. F., with sodium-potassium alloy..... A proportional counter converter, produced by Nuclear Measurements Corp. Indianapolis, Model PGC-14, converts any scaler with a high voltage range of 600-to 2000-volts to a proportional counter. It is designed to count such samples as radioactive precipitates, evaporated salts, compressed pellets, and ashed and filtered samples.

MERGER PLANNED:- Ketay Instrument Corp. (New York), and Norden Laboratories (Milford, Conn.), now plan to merge; the combined firm will be known as Norden-Ketay Corp. Ketay is one of the stockholders in the recently formed Nuclear Science & Engineering Corp. (Pittsburgh) which performs research and engineering services for industry in the nuclear field. Head of Nuclear Science is Gordon Dean, former Chairman, USAEC.

NEW DIRECTOR OF ENGINEERING FOR NUCLEAR INSTRUMENT FIRM:- Anton Electronic Laboratories (Brooklyn, N.Y.), manufacturer of nuclear and electronic equipment, has now appointed Joseph P. Della-Corte as director of engineering. Mr. Della-Corte, who most recently had been assistant to the president, Fairchild Camera & Instrument Co., also had held positions of chief engineer and director of engineering at Fairchild. Anton, leading manufacturer of halogen quenched, stainless steel Geiger-Mueller tubes, and originators of the corona discharge voltage regulator tube, has recently completed instrumentation for the newest nuclear-powered submarine, and has also contributed to the instrumentation of the first such nuclear-powered underseas craft, the Nautilus.

FIRST NON-U.S. FIRM JOINS NUCLEAR TRADE ASSOCIATION:- Union Miniere du Haut-Katanga, Belgian mining concern, with operating properties in the Belgian Congo, whose Shinkolobwe uranium mine is a large supplier to the USAEC, has now become the first company outside the U.S. to join the Atomic Industrial Forum, Inc., (New York), trade association of firms and individuals active in nuclear energy work. The Forum recently opened its membership to non-U.S. affiliates. Alexander Wust, director general, Societe d'Electricite de l'Escaut, Antwerp, Belgium, was the first individual affiliate from abroad.

RAW MATERIALS...prospecting, mining & marketing...

UNITED STATES:- Contracts have now been let by Apache Uranium Corp. for a 228,000-ft. drilling program on properties of the firm in Utah and Colorado. Allied Uranium Corp. (New York), is to conduct the drilling; it is a \$700,000 job..... Central Uranium & Mining Co., which reportedly paid approximately \$1 million for uranium property near Central City, Colo., has scheduled the opening of its mine operations before the end of this month (Nov.). John Roosevelt, youngest son of the late President Franklin D. Roosevelt, is president of the firm..... Amuranium Corp. has now purchased the Red Bluff mine, in Valencia County, N.M., for some \$95,000. Chairman of the Amuranium board T. P. Ansberry states that proven blocked out ore of Red Bluff totals \$300,000 and that other portions of the ground give instrument readings showing a potential of over \$1 million.

CANADA:- At the Meta Uranium Mines property in the Lake Athabaska district, drilling to date has indicated a uranium-bearing zone for a length of 200-ft., and to a depth of 290-ft., below the horizon of the adit crosscut established there, according to company officials..... Assays averaging 0.51% and 0.105% uranium oxide each across 5.0-ft. have been found on the most recent faces of the adit being driven by Uranium Ridge Mines on its Beaverlodge Lake property, the firm states. The company points out that this represents a gross equivalent value of \$73.95 and \$15.22 per ton (using \$7.25/lb. as Government purchase price)..... Underground work is planned by Pitch-Ore Uranium Mines at its 25-claim Orb-Ox group in the Beaverlodge area, north of Black Bay, Northern Saskatchewan, the firm advises. Initial plans are for a test shaft to be sunk to a depth of 50-ft., with at least 200-ft. of underground lateral work being carried out.



- 3 -

INSTRUMENTATION IN OUR EXPANDING ATOMIC AGE: Important excerpts from a talk of that title delivered by R.L. Butenhoff, Chief, Radiation Instruments Branch, USAEC, before National Industrial Conference Board, Oct. 14, 1954, New York City. (Atomic Energy in Industry Conference.)

What part can industry pay in providing nuclear instrumentation and equipment? What are the market potentials? I hope to be able to answer these questions.

Since 1945 (when 15 nuclear instrument companies made 8 products), growth of this industry has been such that now 96 companies make 360 products. The volume of business in 1952 was close to \$20 million; for 1953 we estimate it at \$25 million; and we believe that in 1954 it should be close to \$30 million. By 1960, the nuclear instrument industry should have an annual gross volume of \$50 million.

We estimate that for 1954 the principal purchasers in the radiation instrument market will be the following, based on projections of a survey the USAEC made in 1952: USAEC & its contractors, \$6 million; military & other government agencies, \$9.5 million; private industry, \$4.5 million; universities, hospitals & research institutes, \$3.5 million; export, \$1.5 million; civil defense organizations, \$1 million; and prospectors, \$3.5 million.

For these various markets, here is our estimate of the potential volume of nuclear instruments which will be used during the next five years:

**GOVERNMENT MARKETS:-** The USAEC has over 180,000 radiation instruments on its inventory representing an investment of approximately \$13 million. If we include reactor controls and other electronic circuitry peculiar to the atomic program, we could easily account for another \$20 million. The depreciation and turnover of instruments is high (some 25% per year), and a substantial market should exist in replacement purchases alone. The market for nuclear instruments associated with USAEC operations should remain firm, and may increase to a level of about \$6 million this year, and possibly to a level of \$12 million by 1960. This could mean a market of \$45 million over the next five years.

The opportunities for sales to military agencies reached their peak during 1952 when appropriations were being used for instrument research and development contracts. The market is now largely made up of procurement contracts for those instruments which have passed rigid tests. We believe that in volume it will be less than \$10 million this year, and probably below this level in the future; over the next five years this could mean a market potential of around \$35 million.

For civil defense, it is estimated that in light of the high contamination possibilities of new weapons, over 50,000 survey meters and over 1,500,000 dosimeters will be required. This could mean a \$30 million market over a five year period.

Other Government agencies (Bureau of Standards, FBI, Customs, National Institute of Health, FDA, Department of Agriculture, etc.) will probably buy \$5 million worth of instruments during the next five years.

**RADIOISOTOPE USERS' MARKET:-** Since the rate of increase in the nuclear instrument business closely follows increases in isotope utilization, and in 1954 there were (estimated) 1,014 industrial, 859 medical, and 547 "other" users of radioisotopes, the potential is obvious. We estimate that in the next five years industrial users will purchase \$25 million worth of nuclear instruments; medical users \$20 worth; and "other" users (colleges & university research projects) \$10 million worth.

**EXPORT MARKETS:-** New markets should develop, particularly in Europe and South America. It would seem reasonable to assume that by 1960 such sales will amount to more than \$2 million, which would present a market potential of about \$8 million for the next five years.

**URANIUM MINING MARKETS:-** It is estimated that 30,000 Geiger counters have been built and sold for prospecting this year. There is, however, a growing preference for the more sensitive scintillation counters. On the assumption that current prospecting interest will continue, a potential market of around \$15 million will exist over the next five year period.

**MARKETS ASSOCIATED WITH RESEARCH & POWER REACTORS:-** If ten low cost research reactors, and five power reactors are constructed in the U.S. by private industry during the next five years, one might guess that the market for instruments connected with these reactors will be about \$5 million.

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- 4 -

THE FOREIGN SUPPLY PICTURE: A special condensation of remarks by R. L. Faulkner, assistant director for foreign procurement, USAEC, before NICB Conference on Atomic Energy in Industry, Oct. 13th, 1954, New York City.

When the USAEC began to function in 1947, the bulk of the US's uranium was coming from the Belgian Congo, some from Canada, and an insignificant quantity from the U.S.'s western carnotite deposits. My remarks will be confined to overseas sources.

**BELGIAN CONGO:-** Early in World War II, during the development of the first atomic weapons, the United States and the United Kingdom joined in uranium procurement, through the Combined Development Agency, directed by members appointed by the government of the U.K. and by the USAEC. The Agency's first procurement arrangement was with the Union Miniere du Haut-Katanga, through the Belgian Government in exile. Since it began operations, in 1922, the Shinkolobwe mine of the Union Miniere, in the Belgian Congo, has been the world's most important individual producer of radium and uranium. It was the mainstay of the U.S.'s atomic energy program. At Shinkolobwe, the ore occurs in irregular veins and high-grade bunches in or associated with steeply-dipping quartzites. Originally an open pit operation, it is now entirely underground-worked. While early shipments were of hand-picked ore containing 50-60% uranium oxide, it has become necessary to utilize the lower grade ores there; recently completed are ore processing facilities to utilize these lower grade ores. Additional ore is also being found, and only a pessimist would predict early exhaustion of this mine.

**SOUTH AFRICA:-** In March, 1946, research began in Government laboratories in the U.S., the U.K., and the Union of South Africa on the development of an economic process to recover the relatively small quantities of uranium present in the gold ore tailings of the Union's ore mills. This combined research developed a process which is technically and economically sound. It begins where normal gold recovery operations end. The ore, which has been mined, hoisted, crushed, ground and cyanided to remove the gold, is pumped to the uranium plant where the uranium is dissolved from the rock with dilute sulphuric acid. Yield is low: several tons of these tailings must be leached to yield one pound of uranium. First production in the Union began in October, 1952. Six plants are now in production; on completion of all facilities authorized or planned, there will be in operation in the Transvaal and Orange Free State 15 or 16 plants drawing tailings from 23 to 24 operating gold mines. Total cost, with auxiliary facilities (sulphuric acid plants, etc.) is estimated at close to \$190 million. Financing was by loans, two-thirds by the U.S., through the Export-Import Bank, and one-third by the U.K., through the Ministry of Supply.

**AUSTRALIA:-** Two productive enterprises now underway in this country are Radium Hill and Rum Jungle. At Radium Hill, uranium is found in davidite, a titanium rare earths uranium mineral occurring in steeply-dipping fissure veins up to several meters wide. It has been found persistent both horizontally and in depth, the deepest drill hole intersection to date being about 1600-ft. Treatment problems have been worked out; production has now begun. At Rum Jungle, the principal uranium mineral is uraninite, associated with both oxide and sulphide copper minerals. Consolidated Zinc Corp. manage this project (through a subsidiary) for the Commonwealth Government. Initial operation began last month. Since the Government initiated in June, 1953, a five year period of guaranteed prices similar to those in effect in the U.S. on the Colorado Plateau, more and more companies are putting prospecting crews in the field.

Digressing from the foreign supply picture, I might make some observations concerning thorium, which may become important as a source of atomic fuel. The historic source of thorium has been monazite mined primarily for rare earths. A future continuing demand measured in terms of hundreds of tons of thorium yearly should be supplied by the monazite sands of Travancore (India), the Brazilian monazite deposits, the South African monazite vein deposits, and the monazite sands of Idaho, and the southeastern United States. Thorite and thorianite deposits are also known which may become future sources of the metal.

IONIZING RADIATION...as used in various fields...

Industrial Applications:- Radiation sterilization is a potentially important tool for the pharmaceutical industry, Dr. Samuel A. Goldblith, M.I.T., recently told the Parenteral Drug Association annual meeting in New York City. He emphasized that radiation sterilization should not be looked upon as a replacement for aseptic handling, but rather as a supplement to it. Dr. Goldblith said research has shown that all types of microorganisms can be destroyed in all known types of containers as long as the dimensions of the containers are within the penetration limits of the particular type of radiation being used. He pointed out that spore-forming organisms are relatively resistant to ionizing energy, whereas non-spore forming bacteria, either pathogenic or non-pathogenic, are not so resistant.

Medical Applications:- A promising new technique for attacking cancer of the pancreas, ordinarily extremely difficult to treat, was described today (Nov. 16) by Dr. Paul Harper, assistant professor, department of surgery, University of Chicago, at a meeting in Atlantic City, N.J. of the American College of Surgeons. Dr. Harper, who developed the technique, uses a fine, polyethylene tubing threaded around and through the tumor; the tubing is filled with radioactive iodine. (The radioiodine is inserted in the tubing in liquid form, and the ends of the tubing are filled with either air or mercury and sealed off.) Dr. Harper has used this method in six cases. In three of the four patients who subsequently died from their tumors, it was found that radiation had a marked effect in decreasing the size of the pancreatic tumor. Two of the patients, treated only recently, are still alive. One great advantage of the method is that it provides a localized dose of radiation as high as eight or nine thousand roentgens, which is far above the tolerance level for treatment by external radiation. The treatment may cause a short-lived anemia, but otherwise is accompanied by few side effects.

Agricultural Applications:- Practically all plant breeding in the U.S. using radiation was initiated following World War II when isotopes became more plentiful and the use of radiation more common, Dr. W. Ralph Singleton, biology department, Brookhaven National Laboratory, told a meeting of the crops science divisions of the American Society of Agronomy in St. Paul, Minn., last week. An outstanding development of such radiation genetics is the higher yielding strain of peanuts, and peanuts resistant to leaf spot, developed by Dr. Walton C. Gregory, North Carolina State College, Raleigh, he pointed out. Another landmark, he noted, is development of rust-resistant strains of oats by Calvin F. Konzak, Brookhaven, and by K. J. Frey, Iowa State College, Ames. He said that by studying mutation rates in the "portable field" at Brookhaven (where a cobalt-60 source of 1600 curies is used), investigators have learned the stages in pollen formation that give the highest percentage of mutations.

NEW BOOKS & PUBLICATIONS...on nuclear subjects...

Journal of Nuclear Energy. First issue of this new British quarterly, just released, has an article of interest by P. Fortescue, Harwell, AERE, on The Design of Totally Enclosed Pumps, with particular reference to a 50 HP sodium pump.--Pergamon Press, 242 Marylebone Rd., London N.W.1, Eng. (Rates £4 10s. per vol., or £3 10s. to private subscribers.)

Supplement No. 3, to Atomic Energy Information Kit. (Of the electric Companies public information program.) Comprises a special report by this public relations firm on the activities of publicly owned utilities in the nuclear field, and on industry aspects of the Atomic Energy Act of 1954.--Bozell & Jacobs, Inc., New York 56, N. Y.

Atomic weapons rewards act of 1954. Report from Joint Congressional Committee on Atomic Energy to accompany Senate S.3851, and House H.R. 10203.--Joint Congressional Comm. on Atomic Energy, Washington 25, D. C.

Sincerely,

The Staff,  
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